BILLING CODE: 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XD145

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Seismic Survey in the Beaufort Sea, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental take authorization.

SUMMARY: In accordance with the Marine Mammal Protection Act (MMPA) regulations, notification is hereby given that NMFS has issued an Incidental Harassment Authorization (IHA) to SAExploration, Inc. (SAE) to take, by harassment, small numbers of marine mammals incidental to a marine 3-dimensional (3D) ocean bottom node (OBN) seismic survey program in the Beaufort Sea, Alaska, during the 2014 Arctic open-water season.

DATES: Effective August 25, 2014, through October 31, 2014.

ADDRESSES: Inquiry for information on the incidental take authorization should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910. A copy of the application containing a list of the references used in this document, NMFS' Environmental Assessment (EA) and Finding of No Significant Impact (FONSI), and the IHA may be obtained by writing to the address specified above, telephoning the contact listed below (see FOR FURTHER INFORMATION CONTACT), or visiting the Internet at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.

Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Shane Guan, Office of Protected Resources, NMFS, (301) 427-8401, or Brad Smith, NMFS, Alaska Region, (907) 271-3023.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 et seq.) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined "negligible impact" in 50 CFR 216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the

potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

On December 8, 2013, NMFS received an application from SAE for the taking of marine mammals incidental to a 3D OBN seismic survey program in the Beaufort Sea. After receiving NMFS comments, SAE made revision and updated its IHA application on February 14, 2014, and again on April 23, 2014. In addition, NMFS received the marine mammal mitigation and monitoring plan from SAE on May 15, 2014. NMFS determined that the application was adequate and complete on May 25, 2014.

Detailed descriptions of SAE's 3D OBN seismic survey program are provided in the Federal Register notice for the proposed IHA (79 FR 39914; July 10, 2014). No change has been made in the action described in the Federal Register notice. Please refer to that document for detailed information about the activities involved in the seismic survey program.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to SAE was published in the Federal Register on July 10, 2014 (79 FR 39914). That notice described in detail SAE's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals and the availability of marine mammals for subsistence uses. During the 30-day public comment period, NMFS received only one comment letter, which was a comment letter the Marine Mammal Commission (Commission).

Any comments specific to SAE's application that address the statutory and regulatory

requirements or findings NMFS must make to issue an IHA are addressed in this section of the Federal Register notice.

Comment 1: The Commission requested that NMFS require that after August 25, SAE refrain from initiating or cease seismic activities if an aggregation of bowhead whales or gray whales (i.e., 12 or more whales of any age/sex class that appear to be engaged in a non-migratory, significant biological behavior (e.g., feeding, socializing)) is observed within the 160-dB re 1 μPa zone.

Response: NMFS did not propose the suspension of seismic activities for an aggregation of bowhead whales or gray whales (12 or more whales of any age/sex class) within the Level B harassment zone of 160 dB because the size of the zone is very small (2,990 m radius), and it is not likely that an aggregation of 12 whales could occur in such a small zone. In addition, given that the seismic vessel would be moving at a speed of 4 – 5 knots, and assuming the whales would be relatively stationary, such an aggregation of whales would be exposed to received levels above 160 dB re 1 μPa for less than 13 minutes. Nevertheless, NMFS has worked with SAE to include in the IHA the Commission's recommendation that SAE refrain from initiating or cease seismic activities if an aggregation of bowhead or gray whales (12 or more whales of any age/sex class that appear to be engaged in a non-migratory, significant biological behavior) is observed within the 160-dB re 1 μPa isopleth.

Comment 2: The Commission requested that NMFS only authorize an in-season adjustment in the size of the exclusion and/or disturbance zones if the size(s) of the estimated zones are determined to be too small. The Commission stated that the purpose of sound source verification (SSV) is to ensure protection of marine mammals, and one way to reduce

risk to marine mammals would be to only allow expansion of the exclusion and/or disturbance zones.

Response: NMFS does not agree with the Commission's recommendation. While increasing the size of the exclusion zone may seem to be more protective, if the effectiveness of visual-based marine mammal monitoring remains the same, the actual result may not be an increase in protection. Similarly, reducing the size of the exclusion zone, if determined to be appropriate, may lead to more effective and protective monitoring. For example, if the SSV suggests that the appropriate exclusion and/or disturbance zones are smaller than the ones modeled and monitoring still focuses on the larger modeled zones, it is likely that the effectiveness of marine mammal monitoring could be reduced, as the area to be monitored would be larger than necessary. In addition, larger than realistic exclusion zones would cause unnecessary power down and shutdowns, which could increase the total duration of the seismic surveys and cause unnecessary impacts to the marine environment.

Comment 3: The Commission recommended that NMFS verify that SAE will conduct passive acoustic monitoring before, during, and after seismic activities.

Response: NMFS worked with SAE on the requirement of PAM. SAE will conduct PAM before, during, and after seismic surveys, using specialized autonomous passive acoustical recorders. SAE further stated that PAM will begin soon after the time that SAE receives the IHA and will continue at least 24 hours after source operations have been completed. Depending on environmental conditions, PAM data collection could last longer.

Comment 4: The Commission requested that NMFS require SAE to monitor for marine mammals beginning 30 minutes before survey operations begin, during survey operations, and for 30 minutes after survey operations and other activities have ceased.

Response: SAE is required to monitor for marine mammals beginning 30 minutes before survey operations begin, during survey operations, and for 30 minutes after survey operations and other activities have ceased.

Comment 5: The Commission recommended that NMFS encourage the development of conflict avoidance agreements that reflect the interests of all potentially affected communities and co-management organizations and account for potential adverse impacts on all marine mammal species taken for subsistence.

Response: SAE signed a Conflict Avoidance Agreement (CAA) with the Alaska native bowhead whaling communities, to ensure that there is no unmitigable adverse impacts to subsistence whaling activities from its 3D OBN seismic surveys in the Alaskan Beaufort Sea. For marine mammal species other than bowhead whales, SAE developed a Plan of Cooperation (POC) and engaged with all potentially affected communities and co-management organizations to ensure that potential effects to subsistence activities can be mitigated to the level of being negligible. In addition, SAE developed a marine mammal monitoring and mitigation plan (4MP) to make sure that there will be no unmitigable impacts to subsistence uses of any marine mammal species used by the native communities. Finally, NMFS has rigorously reviewed SAE's POC and 4MP and provided additional recommendations (e.g., passive acoustic monitoring) to further reduce any potential adverse effects. NMFS has subsequently made a determination that SAE's 2014 open-water 3D OBN seismic surveys will not have unmitigable adverse impacts to subsistence uses of any marine mammal species. Neither the MMPA nor its implementing regulations require an independent legal agreement between SAE and any subsistence use representative. SAE has already ensured there will be no unmitigable adverse impact to subsistence uses.

Description of Marine Mammals in the Area of the Specified Activity

The Beaufort Sea supports a diverse assemblage of marine mammals. Table 1 lists the 12 marine mammal species under NMFS jurisdiction with confirmed or possible occurrence in the project area.

Table 1. Marine mammal species with confirmed or possible occurrence in the seismic survey area.

Common Name	Scientific Name	Status	Occurrence	Seasonality	Range	Abundance
Odontocetes Beluga whale (Beaufort Sea stock)	Delphinapterus leucas	-	Common	Mostly spring and fall with some in summer	Russia to Canada	39,258
Killer whale	Orcinus orca	-	Occasional/ Extralimital	Mostly summer and early fall	California to Alaska	552
Harbor porpoise	Phocoena phocoena	-	Occasional/ Extralimital	Mostly summer and early fall	California to Alaska	48,215
Narwhal	Monodon monoceros	-				45,358
Mysticetes Bowhead whale	Balaena mysticetus	Endangered; Depleted	Common	Mostly spring and fall with some in summer	Russia to Canada	16,892
Gray whale	Eschrichtius robustus	-	Somewhat common	Mostly summer	Mexico to the U.S. Arctic Ocean	19,126
Minke whale	Balaenoptera acutorostrata	-				810-1,003
Humpback whale (Central North Pacific stock)	Megaptera novaeangliae	Endangered; Depleted				21,063
Pinnipeds Bearded seal (Beringia distinct population segment)	Erigathus barbatus	Threatened; Depleted	Common	Spring and summer	Bering, Chukchi, and Beaufort Seas	155,000
Ringed seal (Arctic stock)	Phoca hispida	Threatened; Depleted	Common	Year round	Bering, Chukchi, and Beaufort	300,000

					Seas	
Spotted seal	Phoca largha	-	Common	Summer	Japan to U.S. Arctic Ocean	141,479
Ribbon seal	Histriophoca fasciata	Species of concern	Occasional	Summer	Russia to U.S. Arctic Ocean	49,000

"Status" refers to endangered, threatened, or species of concern status under the Endangered Species Act (ESA) and depleted status under the MMPA

The highlighted (grayed out) species in Table 1 are so rarely sighted in the project area that take is unlikely. Minke whales are relatively common in the Bering and southern Chukchi Seas and have recently also been sighted in the northeastern Chukchi Sea (Aerts et al., 2013; Clarke et al., 2013). Minke whales are rare in the Beaufort Sea. They have not been reported in the Beaufort Sea during the Bowhead Whale Aerial Survey Project/Aerial Surveys of Arctic Marine Mammals (BWASP/ASAMM) surveys (Clarke et al., 2011, 2012; 2013; Monnet and Treacy, 2005), and there was only one observation in 2007 during vessel-based surveys in the region (Funk et al., 2010). Humpback whales have not generally been found in the Arctic Ocean. However, subsistence hunters have spotted humpback whales in low numbers around Barrow, and there have been several confirmed sightings of humpback whales in the northeastern Chukchi Sea in recent years (Aerts et al., 2013; Clarke et al., 2013). The first confirmed sighting of a humpback whale in the Beaufort Sea was recorded in August 2007 (Hashagen et al., 2009), when a cow and calf were observed 54 mi east of Point Barrow. No additional sightings have been documented in the Beaufort Sea. Narwhal are common in the waters of northern Canada, west Greenland, and in the European Arctic, but rarely occur in the Beaufort Sea (COSEWIC, 2004). Only a handful of sightings have occurred in Alaskan waters (Allen and Angliss, 2013). These three species are not considered further in this IHA notice. Both the walrus and the polar bear could occur in the

U.S. Beaufort Sea; however, these species are managed by the U.S. Fish and Wildlife Service (USFWS) and are not considered further in this IHA notice.

The Beaufort Sea is a main corridor of the bowhead whale migration route. The main migration periods occur in spring from April to June and in fall from late August/early September through October to early November. During the fall migration, several locations in the U.S. Beaufort Sea serve as feeding grounds for bowhead whales. Small numbers of bowhead whales that remain in the U.S. Arctic Ocean during summer also feed in these areas. The U.S. Beaufort Sea is not a main feeding or calving area for any other cetacean species. Ringed seals breed and pup in the Beaufort Sea; however, this does not occur during the summer or early fall. Further information on the biology and local distribution of these species can be found in SAE's application (see ADDRESSES) and the NMFS Marine Mammal Stock Assessment Reports, which are available online at: http://www.nmfs.noaa.gov/pr/species/.

Potential Effects of the Specified Activity on Marine Mammals

Operating active acoustic sources such as airgun arrays, navigational sonars, and vessel activities have the potential for adverse effects on marine mammals. Potential effects from SAE's 3D OBN seismic surveys on marine mammals in the U.S. Beaufort Sea are discussed in the "Potential Effects of the Specified Activity on Marine Mammals" section of the Federal Register notice for the proposed IHA (79 FR 39914; July 10, 2014). No changes have been made to the discussion contained in this section of the Federal Register notice for the proposed IHA.

Anticipated Effects on Habitat

The primary potential impacts to marine mammal habitat are associated with elevated

sound levels produced by airguns and vessels and their affects on marine mammal prey species. These potential effects from SAE's 3D OBN seismic survey are discussed in the "Anticipated Effects on Marine Mammal Habitat" section of the Federal Register notice for the proposed IHA (79 FR 39914; June 14, 2013). No changes have been made to the discussion contained in this section of the Federal Register notice for the proposed IHA.

Mitigation Measures

In order to issue an incidental take authorization under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

For the SAE open-water 3D OBN seismic surveys in the Beaufort Sea, NMFS is requiring SAE to implement the following mitigation measures to minimize the potential impacts to marine mammals in the project vicinity as a result of its survey activities. The primary purpose of these mitigation measures is to detect marine mammals within or about to enter designated exclusion zones and to initiate immediate shutdown or power down of the airgun(s).

(1) Establishing Exclusion and Disturbance Zones

Under current NMFS guidelines, the "exclusion zone" for marine mammal exposure to impulse sources is customarily defined as the area within which received sound levels are ≥180 dB (rms) re 1 μPa for cetaceans and ≥190 dB (rms) re 1 μPa for pinnipeds. These safety criteria are based on an assumption that SPL received at levels lower than these will

not injure these animals or impair their hearing abilities, but that at higher levels might have some such effects. Disturbance or behavioral effects to marine mammals from underwater sound may occur after exposure to sound at distances greater than the exclusion zones (Richardson et al. 1995). Currently, NMFS uses 160 dB (rms) re 1 μPa as the threshold for Level B behavioral harassment from impulses noise.

As discussed in the Federal Register notice for the proposed IHA (79 FR 39914; July 10, 2014), the acoustic propagation of the 440-in^3, 880-in^3, and 1,760-in^3 airgun arrays were predicted using JASCO's model provided in Aerts et al. (2008), corrected with the measured or manufacturer's source levels. The resulting isopleths modeled for the 190, 180, and 160 dB (rms) re 1 μPa exclusion zones and zones of influence are listed in Table 2.

Table 2. Modeled airgun array source levels and exclusion zone and zones of influence radii

Array size (in^3)	Source level (dB)	190 dB radius (m)	180 dB radius (m)	160 dB radius (m)
440	221.08	126	325	1,330
880	226.86	167	494	1,500
1,760	236.55	321	842	2,990

These safety distances will be implemented at the commencement of 2014 airgun operations to establish marine mammal exclusion zones used for mitigation. SAE will conduct sound source measurements of the airgun array at the beginning of survey operations in 2014 to verify the size of the various marine mammal exclusion zones. The acoustic data will be analyzed in the field as quickly as reasonably practicable and used to verify and adjust, as necessary, the marine mammal exclusion zone distances. The mitigation measures to be implemented at the 190 and 180 dB (rms) sound levels will include power downs and

shutdowns as described below.

(2) Vessel Related Mitigation Measures

These mitigation measures apply to all vessels that are part of SAE's Beaufort Sea seismic survey activities, including supporting vessels.

- Avoid concentrations or groups of whales. Operators of vessels should, at all times, conduct their activities at the maximum distance possible from such concentrations or groups of whales.
- If any vessel approaches within 1.6 km (1 mi) of observed whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the whales by taking one or more of the following actions, as appropriate:
  - Reducing vessel speed to less than 5 knots within 300 yards (900 feet or 274 m) of the whale(s);
  - Steering around the whale(s) if possible;
  - Operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;
  - Operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and
  - Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.
- Reduce vessel speed, not to exceed 5 knots, when weather conditions require, such as when visibility drops, to avoid the likelihood of injury to whales.

(3) Mitigation Measures for Airgun Operations

The primary requirements for airgun mitigation during the seismic surveys are to monitor marine mammals near the airgun array during all daylight airgun operations and during any nighttime start-up of the airguns and, if any marine mammals are observed, to adjust airgun operations, as necessary, according to the mitigation measures described below. During the seismic surveys, PSOs will monitor the pre-established exclusion zones for the presence of marine mammals. When marine mammals are observed within, or about to enter, designated safety zones, PSOs have the authority to call for immediate power down (or shutdown) of airgun operations, as required by the situation. A summary of the procedures associated with each mitigation measure is provided below.

Ramp Up Procedure

A ramp up of an airgun array provides a gradual increase in sound levels, and involves a step-wise increase in the number and total volume of airguns firing until the full volume is achieved. The purpose of a ramp up (or "soft start") is to "warn" cetaceans and pinnipeds in the vicinity of the airguns and to provide time for them to leave the area and thus avoid any potential injury or impairment of their hearing abilities.

During the open-water survey program, the seismic operator will ramp up the airgun arrays slowly. Full ramp ups (i.e., from a cold start after a shutdown, when no airguns have been firing) will begin by firing a single airgun in the array (i.e., the mitigation airgun). A full ramp up, after a shutdown, will not begin until there has been a minimum of 30 minutes of observation of the safety zone by PSOs to assure that no marine mammals are present. The entire exclusion zone must be visible during the 30-minute lead-in to a full ramp up. If the entire exclusion zone is not visible, then ramp up from a cold start cannot begin. If a

marine mammal is sighted within the safety zone during the 30-minute watch prior to ramp up, ramp up will be delayed until the marine mammal is sighted outside of the exclusion zone or the animal is not sighted for at least 15 minutes, for small odontocetes (harbor porpoise) and pinnipeds, or 30 minutes, for baleen whales and large odontocetes (including beluga and killer whales and narwhal).

Use of a Small-Volume Airgun During Turns and Transits

Throughout the seismic survey, during turning movements and short transits, SAE will employ the use of the smallest-volume airgun (i.e., "mitigation airgun") to deter marine mammals from being within the immediate area of the seismic operations. The mitigation airgun will be operated at approximately one shot per minute and will not be operated for longer than three hours in duration (turns may last two to three hours for the project).

During turns or brief transits (i.e., less than three hours) between seismic tracklines, one mitigation airgun will continue operating. The ramp up procedures described above will be followed when increasing the source levels from the one mitigation airgun to the full airgun array. However, keeping one airgun firing during turns and brief transits will allow SAE to resume seismic surveys using the full array without having to ramp up from a "cold start," which requires a 30-minute observation period of the full exclusion zone and is prohibited during darkness or other periods of poor visibility. PSOs will be on duty whenever the airguns are firing during daylight and during the 30-minute periods prior to ramp-ups from a "cold start."

Power Down and Shutdown Procedures

A power down is the immediate reduction in the number of operating energy sources from all firing to some smaller number (e.g., a single mitigation airgun). A shutdown is the

immediate cessation of firing of all energy sources. The array will be immediately powered down whenever a marine mammal is sighted approaching close to or within the applicable exclusion zone of the full array, but is outside the applicable exclusion zone of the single mitigation airgun. If a marine mammal is sighted within or about to enter the applicable exclusion zone of the single mitigation airgun, the entire array will be shut down (i.e., no sources firing). In addition, SAE will implement shutdown measures when aggregations of bowhead whales or gray whales that appear to be engaged in non-migratory significant biological behavior (e.g., feeding, socializing) are observed within the 160-dB harassment zone around the seismic operations.

Poor Visibility Conditions

SAE plans to conduct 24-hour operations. PSOs will not be on duty during ongoing seismic operations during darkness, given the very limited effectiveness of visual observation at night (there will be no periods of darkness in the survey area until mid-August). The provisions associated with operations at night or in periods of poor visibility include the following:

- If during foggy conditions, heavy snow or rain, or darkness (which may be encountered starting in late August), the full 180 dB exclusion zone is not visible, the airguns cannot commence a ramp-up procedure from a full shut-down.
- If one or more airguns have been operational before nightfall or before the onset of poor visibility conditions, they can remain operational throughout the night or poor visibility conditions. In this case ramp-up procedures can be initiated, even though the exclusion zone may not be visible, on the assumption that marine

mammals will be alerted by the sounds from the single airgun and have moved away.

Mitigation Conclusions

NMFS has carefully evaluated SAE's mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

● The manner in which, and the degree to which, the successful implementation of the measures are expected to minimize adverse impacts to marine mammals;

● The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and

● The practicability of the measure for applicant implementation.

Any mitigation measure(s) prescribed by NMFS should be able to accomplish, have a reasonable likelihood of accomplishing (based on current science), or contribute to the accomplishment of one or more of the general goals listed below:

1. Avoidance or minimization of injury or death of marine mammals wherever possible (goals 2, 3, and 4 may contribute to this goal).

2. A reduction in the numbers of marine mammals (total number or number at biologically important time or location) exposed to received levels of seismic airguns, or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

3. A reduction in the number of times (total number or number at biologically

important time or location) individuals would be exposed to received levels of seismic airguns or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing harassment takes only).

4. A reduction in the intensity of exposures (either total number or number at biologically important time or location) to received levels of seismic airguns or other activities expected to result in the take of marine mammals (this goal may contribute to 1, above, or to reducing the severity of harassment takes only).

5. Avoidance or minimization of adverse effects to marine mammal habitat, paying special attention to the food base, activities that block or limit passage to or from biologically important areas, permanent destruction of habitat, or temporary destruction/disturbance of habitat during a biologically important time.

6. For monitoring directly related to mitigation – an increase in the probability of detecting marine mammals, thus allowing for more effective implementation of the mitigation.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS determined that the mitigation measures provide the means of effecting the least practicable impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance. Measures to ensure availability of such species or stock for taking for certain subsistence uses are discussed later in this document (see "Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses" section).

Monitoring and Reporting

In order to issue an ITA for an activity, Section 101(a)(5)(D) of the MMPA states that

NMFS must set forth, "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. SAE submitted a marine mammal monitoring plan as part of the IHA application. The plan may be modified or supplemented based on comments or new information received from the public during the public comment period or from the peer review panel (see the "Monitoring Plan Peer Review" section later in this document).

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

1. An increase in our understanding of the likely occurrence of marine mammal species in the vicinity of the action, i.e., presence, abundance, distribution, and/or density of species.

2. An increase in our understanding of the nature, scope, or context of the likely exposure of marine mammal species to any of the potential stressor(s) associated with the action (e.g. sound or visual stimuli), through better understanding of one or more of the following: the action itself and its environment (e.g. sound source characterization, propagation, and ambient noise levels); the affected species (e.g. life history or dive pattern); the likely co-occurrence of marine mammal species with the action (in whole or part) associated with specific adverse effects; and/or the likely biological or behavioral context of exposure to the stressor for the marine mammal (e.g. age class of exposed animals or known pupping, calving or feeding areas).

3. An increase in our understanding of how individual marine mammals respond (behaviorally or physiologically) to the specific stressors associated with the action (in specific contexts, where possible, e.g., at what distance or received level).

4. An increase in our understanding of how anticipated individual responses, to individual stressors or anticipated combinations of stressors, may impact either: the long-term fitness and survival of an individual; or the population, species, or stock (e.g. through effects on annual rates of recruitment or survival).

5. An increase in our understanding of how the activity affects marine mammal habitat, such as through effects on prey sources or acoustic habitat (e.g., through characterization of longer-term contributions of multiple sound sources to rising ambient noise levels and assessment of the potential chronic effects on marine mammals).

6. An increase in understanding of the impacts of the activity on marine mammals in combination with the impacts of other anthropogenic activities or natural factors occurring in the region.

7. An increase in our understanding of the effectiveness of mitigation and monitoring measures.

8. An increase in the probability of detecting marine mammals (through improved technology or methodology), both specifically within the safety zone (thus allowing for more effective implementation of the mitigation) and in general, to better achieve the above goals.

Monitoring Measures

Monitoring will provide information on the numbers of marine mammals potentially affected by the exploration operations and facilitate real-time mitigation to prevent injury of marine mammals by industrial sounds or activities. These goals will be accomplished in the

Beaufort Sea during 2014 by conducting vessel-based monitoring from both source vessels and the mitigation vessel and an acoustic monitoring program using a bottom-mounted hydrophone array to document marine mammal presence and distribution in the vicinity of the survey area.

Visual monitoring by Protected Species Observers (PSOs) during seismic survey operations, and periods when these surveys are not occurring, will provide information on the numbers of marine mammals potentially affected by these activities and facilitate real-time mitigation to prevent impacts to marine mammals by industrial sounds or operations. Vessel-based PSOs onboard the survey vessels and mitigation vessel will record the numbers and species of marine mammals observed in the area and any observable reaction of marine mammals to the survey activities in the Beaufort Sea.

Visual-based Protected Species Observers (PSOs)

The visual-based marine mammal monitoring will be implemented by a team of experienced PSOs, including both biologists and Inupiat personnel. PSOs will be stationed aboard the survey vessels and mitigation vessel through the duration of the project. The vessel-based marine mammal monitoring will provide the basis for real-time mitigation measures as discussed in the Mitigation Measures section. In addition, monitoring results of the vessel-based monitoring program will include the estimation of the number of "takes" as stipulated in the IHA.

(1) Protected Species Observers

Vessel-based monitoring for marine mammals will be done by trained PSOs throughout the period of survey activities. The observers will monitor the occurrence of marine mammals near the survey vessel during all daylight periods during operation, and

during most daylight periods when operations are not occurring. PSO duties will include watching for and identifying marine mammals; recording their numbers, distances, and reactions to the survey operations; and documenting "take by harassment."

A sufficient number of PSOs will be required onboard each survey vessel to meet the following criteria:

- 100% monitoring coverage during all periods of survey operations in daylight;
- Maximum of 4 consecutive hours on watch per PSO; and
- Maximum of 12 hours of watch time per day per PSO.

PSO teams will consist of Inupiat observers and experienced field biologists. Each vessel will have an experienced field crew leader to supervise the PSO team. The total number of PSOs may decrease later in the season as the duration of daylight decreases.

(2) Observer Qualifications and Training

Crew leaders and most PSOs will be individuals with experience as observers during recent seismic, site clearance and shallow hazards, and other monitoring projects in Alaska or other offshore areas in recent years. New or inexperienced PSOs will be paired with an experienced PSO or experienced field biologist so that the quality of marine mammal observations and data recording is kept consistent.

Biologist-observers will have previous marine mammal observation experience, and field crew leaders will be highly experienced with previous vessel-based marine mammal monitoring and mitigation projects. Resumes for those individuals will be provided to NMFS for review and acceptance of their qualifications. Inupiat observers will be experienced in the region and familiar with the marine mammals of the area. All observers will complete a NMFS-approved observer training course designed to familiarize individuals

with monitoring and data collection procedures.

PSOs will complete a 2-day or ~~3~~-day training and refresher session on marine mammal monitoring, to be conducted shortly before the anticipated start of the 2014 open-water season. Any exceptions will have or receive equivalent experience or training. The training session(s) will be conducted by qualified marine mammalogists with extensive crew-leader experience during previous vessel-based seismic monitoring programs.

(3) Marine Mammal Observer Protocol

Two protected species observers (PSOs) will be stationed on each source vessel. An additional 2 or 3 PSOs will be stationed on the mitigation vessel, and they will work in concert with the PSOs stationed aboard the source vessels, to provide an early warning of the approach of any bowhead whale, beluga, or other marine mammal. The mitigation vessel plans to conduct zig-zag transects from 2 to 6 km ahead of the source vessel (based on water depth and weather conditions) to effectively monitor the 160 dB zone of influence and to also monitor the edge of the 180 dB isopleth.

The PSOs will watch for marine mammals during all periods of source operations and for a minimum of 30 minutes prior to the planned start of airgun or pinger operations after an extended shutdown. Marine mammal monitoring shall continue throughout airgun operations and last for 30 minutes after the finish of airgun firing. SAE vessel crew and operations personnel will also watch for marine mammals, as practical, to assist and alert the PSOs for the airgun(s) to be shut down if marine mammals are observed in or about to enter the exclusion zone.

The PSOs will watch for marine mammals from the best available vantage point on the survey vessels, typically the bridge. The PSOs will scan the area around the vessel

systematically with reticle binoculars (e.g., 7 × 50 and 16-40 × 80) and with the naked eye. Laser range finders (Leica LRF 1200 laser rangefinder or equivalent) will be available to assist with distance estimation.

The observers aboard the survey and mitigation vessels will give particular attention to the areas within the marine mammal exclusion zones around the source vessels. These zones are the maximum distances within which received levels may exceed 180 dB (rms) re 1 μPa (rms) for cetaceans, or 190 dB (rms) re 1 μPa for pinnipeds.

When a marine mammal is seen approaching or within the exclusion zone applicable to that species, the seismic survey crew will be notified immediately so that mitigation measures called for in the applicable authorization(s) can be implemented.

Night-vision equipment (Generation 3 binocular image intensifiers or equivalent units) will be available for use if and when needed. Past experience with night-vision devices (NVDs) in the Beaufort Sea and elsewhere has indicated that NVDs are not nearly as effective as visual observation during daylight hours (e.g., Harris et al. 1997, 1998; Moulton and Lawson 2002).

(4) Field Data-Recording

The PSOs will record field observation data and information about marine mammal sightings that include:

- Species, group size, age/size/sex categories (if determinable);
- Physical description of features that were observed or determined not to be present in the case of unknown or unidentified animals;
- Behavior when first sighted and after initial sighting, heading (if consistent);

- Bearing and distance from observer, apparent reaction to activities (e.g., none, avoidance, approach, paralleling, etc.), closest point of approach, and behavioral pace;
- Time, location, speed, and activity of the source and mitigation vessels, sea state, ice cover, visibility, and sun glare; and
- Positions of other vessel(s) in the vicinity.

Spotted Seal Haulout Monitoring

Given that information on seasonal use of haulout sites by spotted seals remains elusive, SAE will conduct a monitoring program in 2014 largely designed to identify where seals haulout in the action area and to determine whether some areas would need additional monitoring later in 2014 or whether additional mitigation measures would need to be imposed on SAE's future schedule and shot layout. The monitoring will include a biweekly boat-based survey, with the first survey on August 1 and the last survey two weeks after the seismic survey is completed for the year. The survey will begin at the village of Nuiqsut and will initially follow the far west channel of the Colville River, survey all the outer islands of the river delta, and then return to Nuiqsut following the farthest east river channel. The survey will traverse approximately 75 mi and take about a day to complete. All seals will be identified to species, and GPS location and whether the animals were hauled out or in the water will be noted. Collected data will be combined with available traditional knowledge and historical information to determine whether there are locations of consistent seal haulout use that might be affected by seismic surveys. If sites of suspected high use are found, SAE should contact NMFS and the North Slope Borough Department of Wildlife to identify

additional mitigation measures to minimize impacts to these sites.

Passive Acoustic Monitoring

(1) Sound Source Measurements

Prior to or at the beginning of the seismic survey, sound levels will be measured as a function of distance and direction from the seismic source array (full array and reduced to a single mitigation airgun). Results of the acoustic characterization and SSV will be used to empirically refine the modeled distance estimates of the pre-season 190 dB, 180 dB, 170 dB, and 160 dB isopleths. The refined SSV exclusion zones will be used for the remainder of the seismic survey. Distance estimates for the 120 dB isopleth will also be modeled. The results of the SSV will be submitted to NMFS within five days after completing the measurements, followed by a report to be submitted within 14 days after completion of the measurements. A more detailed report will be provided to NMFS as part of the required 90-day report following completion of the acoustic program.

(2) Passive Acoustic Monitoring Using Bottom-mounted Hydrophones

SAE will conduct Passive Acoustical Monitoring (PAM) using specialized autonomous passive acoustical recorders. These recorders will be deployed on the seabed and will record continuously at 64 kHz sample rate and 24-bit samples. The recorders will be calibrated using piston phone calibrators immediately before and after each deployment. These calibrations are accurate to less than 0.5 dB absolute.

The recorders will be configured with a single channel using a sensitive hydrophone and will be configured with an appropriate duty cycle to record at 64 kHz for up to 80 days. The recorders will sit directly on the seabed and will be attached to a ground line with a small weight at its end. Each recorder will be retrieved by using a grapple to catch the ground line

and recover the unit. This simple deployment configuration and retrieval procedure has proven to be very effective for deployments in the Beaufort Sea.

PAM Deployment

Four recorders will be deployed in an arrangement surrounding the survey area for the purposes of PAM. The data collected will be used for post-season analysis of marine mammal vocalization detections to help inform an assessment of potential disturbance effects. The PAM data will also provide information about the long-range propagation of the airgun noise.

Recorder Arrangement

The arrangement of recorders will place one recorder to the east of the survey region, one to the west, and two in the offshore direction. The exact arrangement will be defined based on the specific survey line configuration and will encompass the boundaries of the survey area. The recorders will be positioned at ranges where the sound levels are expected to have decayed to levels at or below 120 dB re 1 µPa, to be determined following analysis of the SSV data.

Data Analysis

PAM recordings will be processed at the end of the season using marine mammal detection and classification software capable of detecting vocalizations from marine mammals. Particular attention will be given to the detection of bowhead whale vocalizations since this is a species of particular concern due to its importance for local subsistence hunting.

PAM recordings will also be used to detect and quantify airgun pulses from the survey as recorded on the PAM recorders, to provide information about the long-range

propagation of the survey noise.

Monitoring Plan Peer Review

The MMPA requires that monitoring plans be independently peer reviewed "where the proposed activity may affect the availability of a species or stock for taking for subsistence uses" (16 U.S.C. 1371(a)(5)(D)(ii)(III)). Regarding this requirement, NMFS' implementing regulations state, "Upon receipt of a complete monitoring plan, and at its discretion, [NMFS] will either submit the plan to members of a peer review panel for review or within 60 days of receipt of the proposed monitoring plan, schedule a workshop to review the plan" (50 CFR 216.108(d)).

NMFS established an independent peer review panel to review SAE's marine mammal monitoring plan. The panel met in March 2014 via video and tele-conferencing, and provided comments to NMFS in April. The full panel report can be viewed on the Internet at: http://www.nmfs.noaa.gov/pr/permits/incidental.htm.

NMFS provided the panel with SAE's IHA application and monitoring plan and asked the panel to answer the following questions:

1. Will the applicant's stated objectives effectively further the understanding of the impacts of their activities on marine mammals and otherwise accomplish the goals stated above? If not, how should the objectives be modified to better accomplish the goals above?

2. Can the applicant achieve the stated objectives based on the methods described in the plan?

3. Are there technical modifications to the proposed monitoring techniques and methodologies proposed by the applicant that should be considered to better accomplish their stated objectives?

4. Are there techniques not proposed by the applicant (i.e., additional monitoring techniques or methodologies) that should be considered for inclusion in the applicant's monitoring program to better accomplish their stated objectives?

5. What is the best way for an applicant to present their data and results (formatting, metrics, graphics, etc.) in the required reports that are to be submitted to NMFS (i.e., 90-day report and comprehensive report)?

The panel raised particular questions and concerns about four aspects of SAE's original proposed monitoring plan. First, SAE proposed having one PSO conducting marine mammal monitoring from the survey vessel during operations. Citing a 2013 90-day marine mammal monitoring report from TGS (Cate et al. 2014), the panel raised concerns that a single PSO would not be able to effectively monitor the entire exclusion zone. Second, SAE proposed conducting passive acoustic monitoring (PAM) as part of its monitoring program. The panel report stated that SAE's IHA application and its marine mammal monitoring and mitigation plan lacked sufficient detail on the PAM SAE proposed. Third, SAE proposed conducting a pinniped aerial monitoring survey. The panel report stated that SAE's IHA application and proposed plan also lacked sufficient detail on the pinniped aerial survey. The panel further stated that an aerial survey is not an effective way to study pinnipeds, with the possible exception of spotted seal use of land haulouts. In addition, the panel stated that it is nearly impossible to use aerial surveys to make inferences into ice seal density or abundance during the open-water season, when seals are likely to be in the water, because such surveys have extremely high availability bias that cannot be reliably estimated. Finally, the panel stated that the residents of Nuiqsut, located near the Colville River delta, had expressed considerable concerns about the frequency of aerial overflights in the area. The panel

determined that the cultural impacts of excessive aerial surveys in this region largely outweighed the value of the ice seal data that could be collected using this methodology. Instead, the panel recommended SAE conduct surveys of the spotted seal coastal haulouts from an unmanned aerial vehicle (UAV), which are considerably quieter than manned aircraft.

Other recommendations from the panel included: (1) requiring a minimum of two PSOs to be on watch throughout all daylight hours, regardless of whether airguns are firing; (2) documenting marine mammal occurrence, density, and behavior during times when airguns are not operating; (3) submitting summary reports with an initial summary or interpretation of the efficacy, measurements, and observations, rather than raw data, fully processed analyses that include a summary of timeline and spatial representation (e.g., a map, with latitude and longitude clearly shown), or a summary of operations and important observations; (4) providing a complete characterization of the acoustic footprint resulting from various activity states; (5) providing a summary of any and all mitigation measures (e.g., operational shutdowns if they occur) and an assessment of the efficacy of the monitoring methods; and (6) collaborating with other industrial operators in the area to integrate and synthesize monitoring results as much as possible (such as submitting "sightings" from their monitoring projects to an online data archive, such as OBIS-SEAMAP) and archiving and making the complete databases available upon request.

Based on the recommendations provided by the panel, NMFS worked with SAE and requested detailed information on the monitoring methodology and survey design. On April 25, 2014, SAE provided an updated IHA application, and on May 15, 2014, an updated Marine Mammal Monitoring and Mitigation Plan (4MP).

In the updated 4MP, SAE provided a detailed description of its plan for using a drift buoy equipped with acoustic sensors for sound source verification (SSV) and a detailed deployment plan for the bottom-mounted hydrophone array for passive acoustic monitoring (PAM) during the seismic survey. In response to the concerns raised by the panel about the pinniped aerial survey, SAE modified the survey protocol to replace the aerial survey with a vessel-based visual survey of spotted seal haulout instead.

NMFS provided the panel with the updated 4MP, for an additional voluntary review. Two of the panel members provided additional comments on SAE's updated 4MP. These panelists again raised concern that the use of a single onboard PSO for marine mammal monitoring would not be adequate to cover the safety zone monitoring. In addition, the panel members raised questions about the use of a drifting buoy for SSV and the marine mammal passive acoustic detection and classification, and requested NMFS to require SAE to consult with NMFS and North Slope Borough Department of Wildlife Management (NSB-DWM) on spotted seal haulout usage prior to issuance of the IHA.

As a result of the independent peer review, NMFS worked with SAE and proposed the following mitigation and monitoring measures based on the panel's recommendations:

(1) PSOs shall monitor and document marine mammal occurrence, density, and behavior for at least some periods when airguns are not operating;

(2) Summaries that represent an initial level of interpretation of the efficacy, measurements, and observations, rather than raw data, fully processed analyses, or a summary of operations and important observations, shall be given in the final report;

(3) Summaries of all mitigation measures (e.g., operational shutdowns if they occur) and an assessment of the efficacy of the monitoring methods shall be provided in the final

report;

(4) A complete characterization of the acoustic footprint resulting from various activity states shall be provided in the final report;

(5) Collaborating with other industrial operators in the area to integrate and synthesize monitoring results as much as possible (such as submitting "sightings" from their monitoring projects to an online data archive, such as OBIS-SEAMAP) and archiving and making the complete databases available upon request; and

(6) Spotted Seal Haulout Monitoring: SAE will conduct a biweekly boat survey of spotted seals, before, during, and after the seismic survey, to identify where seals haulout in the action area. The survey will begin at the village of Nuiqsut and follow the far west channel of the Colville River, survey all the outer islands of the river delta, and then return to Nuiqsut following the farthest eat river channel. All seals will be identified to species, and GPS location and whether the animals were hauled out or in the water will be noted. Collected data will be combined with available traditional knowledge and historical information to determine whether there are locations of consistent seal haulout use that might be affected by the seismic survey. If sites of suspected high use are found, SAE shall contact NMFS and the NSB-DWM to identify additional mitigation measures to minimize impacts to these sites.

Regarding the panel's recommendation that NMFS require a minimum of two PSOs to be on watch throughout all daylight hours, regardless of whether airguns are firing, NMFS discussed the matter with SAE and SAE reported that its source vessel is small and cannot support extra PSOs, for safety reasons. To address the panel's concerns and to compensate for any potential monitoring inadequacy resulting from having only a single PSO

on the source vessel, SAE revised its monitoring plan, so that it will also mobilize a mitigation vessel dedicated to marine mammal monitoring. There will be 2 – 3 PSOs onboard the mitigation vessel. At any given time, there will be 1 – 2 PSOs monitoring from the mitigation vessel, in addition to the PSO monitoring from the source vessel. The mitigation vessel will be positioned north and east of the source vessel, or essentially upstream of the bowhead and beluga migration route.

The panel's concern that monitoring by a single PSO was potentially inadequate was based largely on a 90-day monitoring report submitted by TGS (Cate et al. 2014), in which a sighting curve was provided showing that during dual-PSO effort from an observation height of 6.5 m, using unaided eye, Fujinon 7 x 50 reticle binoculars, or 25 x 150 Fujinon "Big-eyes," the detection probability dropped by 50% within 150 m of the ship, meaning there could be whales within the exclusion zone that may not be detected. However, the sighting curve developed for that 90-day report was solely based on observations obtained on a 2D seismic survey by TGS in offshore water. SAE plans to survey in relatively calmer coastal shallow waters, and therefore, marine mammal detection rates should be higher for SAE's survey. In addition, the TGS sighting curve does not separate marine mammals by species, but rather combines all sightings from large bowhead whales to small pinnipeds and harbor porpoises. Therefore, NMFS does not believe the sighting curve provided by TGS provides an accurate assessment of species-specific marine mammal detection as a function of distance, particularly for large mysticetes.

As one of the ultimate goals of adequate monitoring is to support protective measures to prevent marine mammals from being exposed to noise levels that could cause injury (Level A harassment) or other harmful effects, NMFS analyzed the effectiveness of the

monitoring protocol proposed by SAE to make a determination whether the protocol provides adequate measures for protecting marine mammals. One factor that NMFS took into consideration is that the airgun array proposed to be used by SAE for its survey is much smaller than the one used by TGS. The ensonified zones from the SAE seismic survey will be much smaller. In addition, marine mammals are known to avoid intense sound and most likely will move out of the area as the seismic vessel approaches. SAE also will have a separate mitigation vessel with additional PSOs to provide additional monitoring of the ensonified zones. Therefore, for this seismic survey, NMFS considered the proposed vessel-based marine mammal monitoring to be adequate for supporting mitigation.

Reporting Measures

(1) Sound Source Verification Report

A report on the preliminary results of the sound source verification measurements, including the measured 190, 180, 170, and 160 dB (rms) radii of the airgun sources, will be submitted within 14 days after collection of those measurements at the start of the field season. This report will specify the distances of the exclusion zones that were adopted for the survey.

(2) Technical Report

The results of SAE's 2014 vessel-based monitoring, including estimates of "take" by harassment, will be presented first in a "90-day" draft Technical Report, to be submitted to NMFS within 90 days after the end of the seismic survey, and then in a final Technical Report, which will address any comments NMFS had on the draft. The Technical Report will include:

(a) Summaries of monitoring effort (e.g., total hours, total distances, and marine

mammal distribution through the study period, accounting for sea state and other factors affecting visibility and detectability of marine mammals);

(b) Analyses of the effects of various factors influencing detectability of marine mammals (e.g., sea state, number of observers, and fog/glare);

(c) Species composition, occurrence, and distribution of marine mammal sightings, including date, water depth, numbers, age/size/gender categories (if determinable), group sizes, and ice cover;

(d) Data analysis separated into periods when a seismic airgun array (or a single mitigation airgun) is operating and when it is not, to better assess impacts to marine mammals – the final and comprehensive report to NMFS should summarize and plot:

- Data for periods when a seismic array is active and when it is not; and
- The respective predicted received sound conditions over fairly large areas (tens of km) around operations;

(e) Sighting rates of marine mammals during periods with and without airgun activities (and other variables that could affect detectability), such as:

- Initial sighting distances versus airgun activity state;
- Closest point of approach versus airgun activity state;
- Observed behaviors and types of movements versus airgun activity state;
- Numbers of sightings/individuals seen versus airgun activity state;
- Distribution around the survey vessel versus airgun activity state; and
- Estimates of take by harassment;

(f) Results from all hypothesis tests, including estimates of the associated statistical

power, when practicable;

(g) Estimates of uncertainty in all take estimates, with uncertainty expressed by the presentation of confidence limits, a minimum-maximum, posterior probability distribution, or another applicable method, with the exact approach to be selected based on the sampling method and data available;

(h) A clear comparison of authorized takes and the level of actual estimated takes; and

(i) The methodology used to estimate marine mammal takes and relative abundance from the towed PAM.

(3) Notification of Injured or Dead Marine Mammals

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as an injury (Level A harassment), serious injury, or mortality (e.g., ship-strike, gear interaction, and/or entanglement), SAE would immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinators. The report would include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;

- Water depth;
- Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the prohibited take. NMFS would work with SAE to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SAE would not be able to resume its activities until notified by NMFS via letter, email, or telephone.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), SAE would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinators. The report would include the same information identified in the paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with SAE to determine whether modifications in the activities are appropriate.

In the event that SAE discovers an injured or dead marine mammal, and the lead PSO

determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SAE would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the NMFS Alaska Stranding Hotline and/or by email to the Alaska Regional Stranding Coordinators, within 24 hours of the discovery. SAE would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network. SAE can continue its operations under such a case.

Monitoring Results from Previously Authorized Activities

SAE requested an IHA for a 3D OBN seismic survey in the Beaufort Sea in 2013, but the IHA application was withdrawn before an IHA was issued. Therefore, there are no previous monitoring results from this project.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Only take by Level B behavioral harassment of some species is anticipated as a result of SAE's 3D OBN seismic survey. NMFS expects marine mammal takes could result from noise propagation from operation of seismic airguns. NMFS does not expect marine mammals will be taken by collision with seismic and support vessels, because the vessels

will be moving at low speeds, and PSOs on the survey vessels and the mitigation vessel will be monitoring for marine mammals and will be able to alert the vessels to avoid any marine mammals in the area.

For impulse sounds, such as those produced by the airguns to be used in SAE's 3D OBN seismic surveys, NMFS uses the 160 dB (rms) re 1 μPa isopleth to indicate the onset of Level B harassment. SAE provided calculations of the 160-dB isopleths expected to be produced by the seismic surveys and then used those isopleths to estimate takes by harassment. NMFS used those calculations to make the necessary MMPA findings. SAE provided a full description of the methodology used to estimate takes by harassment in its IHA application, which is also provided in the following sections.

Acoustic Footprint

The areas ensonified by seismic airgun noise that could cause marine mammal takes under MMPA was determined by assuming that the entire survey area is ensonified (given that the distance to the 160 dB isopleth during seismic survey is greater than the distance between seismic source lines), and adding a buffer area around the survey box corresponding to the distance to the 160 dB isopleth. The estimated distance to the 160 dB isopleth is 3 kilometers (1.86 miles) (Table 2) based on a sound source of 236.55 dB re 1 μPa (rms) for the 1,760 in^3 seismic array and a spreading model of 18 LogR - 0.0047R estimated for similar Beaufort nearshore waters (BP Liberty) by Aerts et al. (2008). Placing a 3-kilometer buffer around the 1,882-km^2 (727-mi^2) seismic source area expands the ensonification (or Zone of Influence [ZOI]) area to approximately 2,295 km^2 (886 mi^2), and represents the ZOI for pinnipeds. (The distance to the 160 dB isopleth when operating the 880 in^3 airgun array is 1.5 km (0.9 mi).)

Within the 2,295 km^2 ensonified area, 19% (431 km^2) falls within the 0 to 1.5 m depth range, 14% (326 km^2) falls within the 1.5 to 5 m range, 39% (903 km^2) with the 5 to 15 m range, and 28% (635 km^2) within waters greater than 15 m deep (bowhead migration corridor). The distribution of these depth ranges is found in Figure 6-1 of the IHA application.

Marine Mammal Densities

Density estimates were derived for bowhead whales, beluga whales, ringed seals, spotted seals, and bearded seals as described below and shown in Table 3. There are no available Beaufort Sea density estimates for gray whales or extralimital species, such as killer whales, harbor porpoises, humpback whales, narwhals, and ribbon seals. Encountering these animals during the seismic program would be unexpected. The density derivations for the five species presented in Table 3 are provided in the discussion below.

Table 3. Marine mammal densities (#/km^2) in the Beaufort Sea

Species	Summer	Fall
Bowhead whale	0.0672	0.0910
Beluga whale	0.0327	0.0175
Ringed seal	0.3547	0.2510
Spotted seal	0.0177	0.0125
Bearded seal	0.0177	0.0125

Bowhead Whale: The summer density estimate for bowhead whales was derived from July and August aerial survey data collected in the Beaufort Sea during the Aerial Surveys of Arctic Marine Mammals (ASAMM) program in 2012 and 2013. During this period, 276 bowhead whales were record along 24,560 km of transect line, or 0.0112 whales per km of transect line. Applying an effective strip half-width (ESW) of 1.15 (Ferguson and

Clarke 2013), results in an uncorrected density of 0.0049. Thomas et al.'s (2002) correction factors (g(0)) for availability (0.144) and observer (0.505) bias were applied producing an estimated density of 0.0672 whales per km^2. This is a much higher density than previous estimates (e.g., Brandon et al. 2011) due to relatively high numbers of whales recorded in the Beaufort Sea in August 2013. In 2013, 205 whales were recorded along 9,758 km of transect line (corrected density = 0.1251), with 78% of the sightings (160 whales) recorded in the easternmost blocks, Blocks 4, 5, 6, and 7. In contrast, 26 of the 71 whales (37%) recorded on-transect during summer 2012 were at or near Barrow Canyon (Block 12), or the western extreme of the Alaskan Beaufort Sea, while another 26 (37%) were recorded at the eastern extreme (Blocks 4, 5, 6, and 7). For both years combined, only 8 of the 276 (2.9%) recorded during the summer were found in Block 3 where the seismic survey is planned.

Fall density estimate was determined from September and October ASAMM data collected from 2006 to 2013. The Western Arctic stock of bowhead whale has grown considerably since the late 1970s; thus, data collected prior to 2006 probably does not well represent current whale densities. From 2006 to 2013, 1,286 bowhead whales were recorded along 84,400 km of transect line, or 0.1524 per km. Using an ESW of 1.15 results in an uncorrected density of 0.0066. Applying the availability and observer bias correction factors from Thomas et al. (2002) derives a corrected fall density estimate of 0.0910.

Beluga Whale: There is little information on summer use by beluga whales in the Beaufort Sea. Moore et al. (2000) reported that only 9 beluga whales were recorded in waters less than 50 m deep during 11,985 km of transect survey effort, or about 0.00057 whales per km. Assuming an ESW of 0.614 and a 2.62 (Lloyd and Frost 1995) correction factor for whales missed (availability and observer bias of adults) and a 1.18 (Brodie 1971)

correction factor for dark juveniles, both correction factors used by NMFS for the annual Alaska Stock Assessment Reports, the derived corrected density would be 0.0014 whales per mi^2. The same data showed much higher beluga numbers in deeper waters.

During the summer aerial surveys conducted during the 2012 ASAMM program (Clarke et al. 2013), 5 beluga whales were observed along 1,431 km of transect in waters less than 20 m deep and between longitudes 140°W and 154°W (the area within which the seismic survey would fall). This equates to 0.0035 whales per km of trackline and an uncorrected density of 0.0028, assuming an ESW of 0.614. Applying correction factors for animals missed (2.62 for adults and 1.18 for juveniles) results in a corrected summer density estimate of 0.0088. Summer beluga data was also collected in 2013. This data, currently available in posted daily reports, does not parse the data by depth or longitude and, therefore, is not yet directly comparable to the 2012 data. Fourteen whales were observed along 340 km of survey in block 3 in 2013, which is the survey block in which the seismic survey area falls. Adding the Block 3 data to the 2012 data results in 23 whales observed over 1,771 km of transect effort, or 0.0130 whales per km and 0.0107 per km^2. Applying the correction factors described above, the summer density estimate would increase to 0.0327. This density value is probably inflated due to the limited survey effort in 2013, but it represents a conservative estimate and is the value used in the take estimate.

Calculated fall beluga densities are approximately twice as high as summer densities. Between 2006 and 2012, 2,210 beluga were recorded along 79,586 km of transect line flown during September and October, or 0.0278 beluga per km of transect. Assuming an ESW of 0.614 gives an uncorrected density of 0.0226, and a corrected density of 0.0699. However, unlike in summer, almost none of the fall migrating belugas were recorded in waters less than

20 meters deep. For years where depth data is available (2006, 2009-2012), only 11 of 1,605 (1%) recorded belugas were found in waters less than 20 m during the fall. To take into account this bias in distribution, but to remain conservative, the corrected density estimate is reduced to 25%, or 0.0175.

Ringed Seal: Surveys for ringed seals have been recently conducted in the Beaufort Sea by Kingsley (1986), Frost et al. (2002), Moulton and Lawson (2002), Green and Negri (2005), and Green et al. (2006, 2007). The shipboard monitoring surveys by Green and Negri (2005) and Green et al. (2006, 2007) were not systematically based, but are useful in estimating the general composition of pinnipeds in the Beaufort nearshore, including the Colville River Delta. Frost et al.'s aerial surveys were conducted during ice coverage and don't fully represent the summer and fall conditions under which the Beaufort surveys will occur. Moulton and Lawson (2002) conducted summer shipboard-based surveys for pinnipeds along the nearshore Beaufort Sea coast and developed seasonal average and maximum densities representative of SAE's Beaufort summer seismic project, while Kingsley (1986) conducted surveys along the ice margin representing fall conditions. Therefore, the Moulton and Lawson (2002) and Kingsley (1986) ringed seal densities were used as the estimated densities of ringed seals in the survey area.

Spotted Seal: Green and Negri (2005) and Green et al. (2006, 2007) recorded pinnipeds during barging activity between West Dock and Cape Simpson, and found high numbers of ringed seal in Harrison Bay, and peaks in spotted seal numbers off the Colville River Delta where a haulout site is located. Approximately 5% of all phocid sightings recorded by Green and Negri (2005) and Green et al. (2006, 2007) were spotted seals, which provide a suitable estimate of the proportion of ringed seals versus spotted seals in the

Colville River Delta and Harrison Bay. Thus, the estimated densities of spotted seals in the seismic survey area were derived by multiplying the ringed seal densities from Moulton and Lawson (2002) and Kingsley (1986) by 0.05.

Bearded Seal: Bearded seals were also recorded in Harrison Bay and the Colville River Delta by Green and Negri (2005) and Green et al. (2006, 2007), but at lower proportions than spotted seals, when both were compared to ringed seals. However, estimating bearded seal densities based on the proportion of bearded seals observed during the barge-based surveys results in density estimates that appear unrealistically low given density estimates from other studies, and especially given that nearby Thetis Island is used as a base for annually hunting this seal (densities are seasonally high enough for focused hunting). To be conservative, the bearded seal density values used in this application are derived from Stirling et al.'s (1982) observations that the proportion of eastern Beaufort Sea bearded seals is 5% that of ringed seals, which is similar to the calculations done for spotted seals.

Exposure Calculations

The estimated potential harassment take of local marine mammals by SAE's Beaufort seismic survey project was determined by multiplying the animal densities in Table 3 by the area ensonified by seismic airgun noise greater than 160 dB re 1 μPa (rms) that constitutes habitat for each respective species. For pinnipeds, which occupy all water depths, this includes the entire seismic survey area, plus the additional 3-km (1.86-mi) buffer of noise exceeding 160 dB, or 2,295 km^2 (886 mi^2). The results are further corrected by multiplying the summer numbers by 26%, to account for the percentage of the survey that was proposed be conducted in the summer season (August 15 – 31, 16 days), and multiplying the fall

numbers by 74%, to account for the percentage of the survey that was proposed to be conducted in the fall season (September 1 – October 15, 45 days).

Although the vast majority of bowhead whales migrate through the Beaufort Sea in waters greater than 15 m (50 ft) deep (Miller et al. 2002), feeding and migrating bowheads have been found in waters as shallow as 5 m (16 ft) (Clarke et al. 2011). Thus, the seismic survey area potentially inhabitable by bowhead whales is all waters greater than 5 m deep. This area, including the 3-km buffer, is 1,538 km^2 (594 mi^2).

Beluga whales have been observed inside the barrier islands, where they would have to traverse water depths as low as 1.8 m, but these whales are unlikely to inhabit the shallowest water (<1.5 m deep) inside the barrier islands, where stranding risk can be high. For the seismic survey, the area of beluga habitat potentially ensonified (>160 dB) by the seismic operations is the waters greater than 1.5 m (5 ft) deep, plus the 3-km buffer, or approximately 1,864 km^2 (720 mi^2). The resulting exposure calculations are found in Table 4.

Table 4. The average number of animals potentially exposed to received sound levels > 160 dB

Species	Summer	Fall	Total	Population	% Affected
Bowhead whale	27	104	131	12,631	1.04%
Beluga whale (Beaufort Sea stock)	16	24	40	39,258	0.10%
Beluga whale (E. Chukchi Sea stock)	16	24	40	3,710	1.08%
Ringed seal	212	426	638	249,000	0.26%
Spotted seal	11	21	32	101,568	0.03%
Bearded seal	11	21	32	155,000	0.02%

The estimated number of marine mammal exposures was based on the average density in the area of summer or fall habitat that could be ensonified by SAE's proposed activities. Given that the estimated densities are overestimates of the expected densities in

Block 3 (based on ASAMM survey data), especially for bowhead and beluga whales, no adjustments were made to account for variability. Most of the summer sightings are well east or west of Block 3, and the great majority of the fall sightings are in deeper water than Block 3.

The take estimates do not account for mitigation measures that will be implemented. These mitigation measures include shutting down operations during the fall bowhead hunt (thereby avoiding any noise exposure during the peak of fall bowhead whale and beluga migration) and plans for conducting the seismic survey in August in waters greater than 15 m (50 ft) deep (thereby avoiding seismic survey within the bowhead whale migration corridor after the fall hunt). These measures, coupled with the ramp up procedures for airguns, should reduce the estimated take from seismic survey operations.

The estimated take as a percentage of the marine mammal stock is 1.08% or less in all cases (Table 4). The highest percent of population estimated to be taken is 1.08% for the East Chukchi Sea stock of beluga whale. However, that percentage assumes that all 40 beluga whales taken are from that population. Similarly, the 0.10% potential take percentage for the Beaufort Sea stock of beluga whale assumes that all 40 beluga whales are taken from the Beaufort Sea stock. Most likely, some beluga whales would be taken from each stock, meaning fewer than 40 beluga whales would be taken from either individual stock. Therefore, the take of beluga whales as a percentage of populations would likely be below 0.10 and 1.08% for the Beaufort Sea and East Chukchi Sea stocks, respectively. In addition, the estimated take for the East Chukchi Sea stock does not take into account mitigation measures, such as curtailing survey activities during the fall bowhead whale hunt, shutdowns within the harassment zone for cow/calf pairs, and possibly completing the survey of the

more offshore waters in the summer. These actions would reduce the potential encounters with bowhead and beluga whales in the fall.

Analysis and Determinations

Negligible Impact

Negligible impact is "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival" (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (i.e., population-level effects). An estimate of the number of Level B harassment takes, alone, is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the number and nature of estimated Level A harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

No injuries or mortalities are anticipated to occur as a result of SAE's 3D OBN seismic survey, and none are proposed to be authorized. Additionally, animals in the area are not expected to incur hearing impairment (i.e., TTS or PTS) or non-auditory physiological effects. The takes that are anticipated and authorized are expected to be limited to short-term Level B behavioral harassment. While pinnipeds are likely to be found in the project area more frequently, their distribution is dispersed enough that they likely will not be in the Level B harassment zone continuously. As mentioned previously in this document,

pinnipeds appear to be more tolerant of anthropogenic sound than mysticetes.

Most of the bowhead whales encountered will likely show overt disturbance (avoidance) only if they receive airgun sounds with levels ≥ 160 dB re 1 μPa. Odontocete reactions to seismic airgun pulses are generally assumed to be limited to shorter distances from the airgun than are those of mysticetes, in part because odontocete low-frequency hearing is assumed to be less sensitive than that of mysticetes. However, at least when in the Canadian Beaufort Sea in summer, belugas appear to be fairly responsive to seismic energy, with few being sighted within 6–12 mi (10–20 km) of seismic vessels during aerial surveys (Miller et al. 2005). Belugas will likely occur in small numbers in the Beaufort Sea during the survey period and few will likely be affected by the survey activity.

As noted, elevated background noise level from the seismic airgun reverberant field could cause acoustic masking to marine mammals and reduce their communication space. However, even though the decay of the signal is extended, the fact that pulses are separated by approximately 8 to 10 seconds for each individual source vessel (or 4 to 5 seconds when taking into account the two separate source vessels stationed 300 to 335 m (990 to 1,100 ft) apart) means that overall received levels at distance are expected to be much lower, thus resulting in less acoustic masking.

Taking into account the mitigation measures that are planned, effects on marine mammals are generally expected to be restricted to avoidance of a limited area around SAE's open-water activities and short-term changes in behavior, falling within the MMPA definition of "Level B harassment." The many reported cases of apparent tolerance by cetaceans to seismic exploration, vessel traffic, and some other human activities show that co-existence is possible. Mitigation measures, such as controlled vessel speed, dedicated

marine mammal observers, non-pursuit, ramp up procedures, and shutdowns or power downs when marine mammals are seen within defined ranges, will further reduce short-term reactions and minimize any effects on hearing sensitivity. In all cases, the effects are expected to be short-term, with no lasting biological consequence.

Of the five marine mammal species likely to occur in the marine survey area, bowhead whales and ringed and bearded seals are listed as endangered or threatened under the ESA. These species are also designated as "depleted" under the MMPA. Despite these designations, the Bering-Chukchi-Beaufort stock of bowheads has been increasing at a rate of 3.4 percent annually for nearly a decade (Allen and Angliss 2010). Additionally, during the 2001 census, 121 calves were counted, which was the highest yet recorded. The calf count provides corroborating evidence for a healthy and increasing population (Allen and Angliss 2010). There is no critical habitat designated in the U.S. Arctic for the bowhead whales. The Alaska stock of bearded seals, part of the Beringia distinct population segment (DPS), and the Arctic stock of ringed seals have recently been listed by NMFS as threatened under the ESA. The only other species that may occur in the project area that is listed as endangered or threatened under the ESA is the humpback whale, which is also listed as depleted under the MMPA, but the occurrence of humpback whales in the marine survey area is considered very rare. None of the other species that may occur in the project area are listed as threatened or endangered under the ESA or designated as depleted under the MMPA.

Potential impacts to marine mammal habitat were discussed previously in this document (see the "Anticipated Effects on Habitat" section). Although some disturbance of food sources of marine mammals is possible, any impacts are anticipated to be minor enough

as to not affect rates of recruitment or survival of marine mammals in the area. The marine survey activities would occur in a localized area, and given the vast area of the Arctic Ocean where feeding by marine mammals occurs, any missed feeding opportunities in the direct project area could be offset by feeding opportunities in other available feeding areas.

In addition, no important feeding or reproductive areas are known in the vicinity of SAE's seismic surveys at the time the surveys are to take place. No critical habitat of ESA-listed marine mammal species occurs in the Beaufort Sea.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from SAE's 3D OBN seismic survey in the Beaufort Sea, Alaska, will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

The requested takes authorized represent less than 1.08% of all populations or stocks potentially impacted (see Table 4 in this document). These take estimates represent the percentage of each species or stock that could be taken by Level B behavioral harassment if each animal is taken only once. The numbers of marine mammals estimated to be taken are small proportions of the total populations of the affected species or stocks. In addition, the mitigation and monitoring measures (described previously in this document) included in the IHA are expected to reduce even further any potential disturbance to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS finds that small numbers of marine mammals

will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

Relevant Subsistence Uses

The seismic activities will occur within the marine subsistence area used by the village of Nuiqsut. Nuiqsut was established in 1973 at a traditional location on the Colville River providing equal access to upland (e.g., caribou, Dall sheep) and marine (e.g., whales, seals, and eiders) resources (Brown 1979). Although Nuiqsut is located 40 km (25 mi) inland, bowhead whales are still a major fall subsistence resource. Although bowhead whales have been harvested in the past all along the barrier islands, Cross Island is the site currently used as the fall whaling base, as it includes cabins and equipment for butchering whales. However, whalers must travel about 160 km (100 mi) to annually reach the Cross Island whaling camp, which is located in a direct line over 110 direct km (70 mi) from Nuiqsut. Whaling activity usually begins in late August with the arrival whales migrating from the Canadian Beaufort Sea, and may occur as late as early October, depending on ice conditions and quota fulfillment. Most whaling occurs relatively near (<16 km or <10 mi) the island, largely to prevent meat spoilage that can occur with a longer tow back to Cross Island. Since 1993, Cross Island hunters have harvested one to four whales annually, averaging three.

Cross Island is located 70 km (44 mi) east of the eastern boundary of the seismic survey box. (Point Barrow is over 180 km [110 mi] outside the potential survey box.) Seismic activities are unlikely to affect Barrow or Cross Island based whaling, especially if the seismic operations temporarily cease during the fall bowhead whale hunt.

Although Nuiqsut whalers may incidentally harvest beluga whales while hunting

bowheads, these whales are rarely seen and are not actively pursued. Any harvest that would occur would most likely be in association with Cross Island.

The potential seismic survey area is also used by Nuiqsut villagers for hunting seals. All three seal species that are likely to be taken – ringed, spotted, and bearded – are hunted. Sealing begins in April and May when villagers hunt seals at breathing holes in Harrison Bay. In early June, hunting is concentrated at the mouth of the Colville River, where ice breakup flooding results in the ice thinning and seals becoming more visible.

Once the ice is clear of the Delta (late June), hunters will hunt in open boats along the ice edge from Harrison Bay to Thetis Island in a route called "round the world." Thetis Island is important as it provides a weather refuge and a base for hunting bearded seals. During July and August, ringed and spotted seals are hunted in the lower 65 km (40 mi) of the Colville River proper.

In terms of pounds, approximately one-third of the village of Nuiqsut's annual subsistence harvest is marine mammals (fish and caribou dominate the rest), of which bowhead whales contribute by far the most (Fuller and George 1999). Seals contribute only 2 to 3% of annual subsistence harvest (Brower and Opie 1997, Brower and Hepa 1998, Fuller and George 1999). Fuller and George (1999) estimated that 46 seals were harvested in 1992. The more common ringed seals appear to dominate the harvest, although the larger and thicker-skinned bearded seals are probably preferred. Spotted seals occur in the Colville River Delta in small numbers, which is reflected in the harvest.

Available harvest records suggest that most seal harvest occurs in the months preceding the proposed August start of the seismic survey, when waning ice conditions provide the best opportunity to approach and kill hauled out seals. Much of the late summer

seal harvest occurs in the Colville River as the seals follow fish runs upstream. Still, open-water seal hunting could occur coincident with the seismic surveys, especially bearded seal hunts based from Thetis Island. In general, however, given the relatively low contribution of seals to the Nuiqsut subsistence, and the greater opportunity to hunt seals earlier in the season, any potential impact by the seismic survey on seal hunting is likely remote.

Potential Impacts to Subsistence Uses

NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as: "an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Noise and general activity during SAE's 3D OBN seismic survey have the potential to impact marine mammals hunted by Native Alaskans. In the case of cetaceans, the most common reaction to anthropogenic sounds (as noted previously) is avoidance of the ensonified area. In the case of bowhead whales, this often means that the animals divert from their normal migratory path by several kilometers. Additionally, general vessel presence in the vicinity of traditional hunting areas could negatively impact a hunt. Native knowledge indicates that bowhead whales become increasingly "skittish" in the presence of seismic noise. Whales are more wary around the hunters and tend to expose a much smaller portion of their back when surfacing, which makes harvesting more difficult. Additionally, natives report that bowheads exhibit angry behaviors, such as tail-slapping, in the presence of

seismic activity, which translate to danger for nearby subsistence harvesters.

Responses of seals to seismic airguns are expected to be negligible. Bain and Williams (2006) studied the responses of harbor seals, California sea lions, and Steller sea lions to seismic airguns and found that seals at exposure levels above 170 dB re 1 μPa (peak-peak) often showed avoidance behavior, including generally staying at the surface and keeping their heads out of the water, but that the responses were not overt, and there were no detectable responses at low exposure levels.

Plan of Cooperation or Measures to Minimize Impacts to Subsistence Hunts

Regulations at 50 CFR 216.104(a)(12) require IHA applicants for activities that take place in Arctic waters to provide a Plan of Cooperation (POC) or information that identifies what measures have been taken and/or will be taken to minimize adverse effects on the availability of marine mammals for subsistence purposes.

SAE prepared a POC, which was developed by identifying and evaluating any potential effects the seismic survey might have on seasonal abundance that is relied upon for subsistence use. For the project, SAE stated that it is working closely with the North Slope Borough (NSB) and its partner Kuukpik Corporation, to identify subsistence communities and activities that may take place within or near the project area.

SAE adopted a three-stage process to develop its POC:

Stage 1: SAE attended the AEWC's mini-convention in December 2013, in Anchorage, and presented a description of the seismic survey program to the AEWC. Collaboration meetings were also held in March and April 2014 with Kuukpik Corporation leaders. Kuukpik Corporation is SAE's joint venture partner in the project and on the North Slope of Alaska.

In addition, SAE met and consulted with nearby communities, namely the NSB planning department and the Fish and Wildlife division. SAE also presented its proposed project and discussed planned activities during community meetings in the villages of Nuiqsut and Kaktovik. The meetings included discussions of SAE's project description, potential ways to resolve potential conflicts, and the proposed operational timeframe. These meetings helped to identify any subsistence conflicts and allowed SAE to understand community concerns, and requests for communication or mitigation. The following community and stakeholder meetings were conducted:

- December 13, 2013 AEWC
- February 27, 2014 Barrow (NSB)
- February, 10, 11, 12, 2014 AEWC
- January, 15 2014 Nuiqsut
- April 22, 2014 Nuqsut (seals)
- May 14, 2014 Kaktovik

Stage 2: SAE documented results of all meetings and incorporated them into the POC, as applicable, to mitigate concerns. SAE will also review permit stipulations and develop a permit matrix for the crews. SAE will develop appropriate means of communication and a contact list to communicate with appropriate stakeholders, and these will be incorporated into operations. The use of scientific and Inupiat PSOs/Communicators on board the vessels will ensure that appropriate precautions are taken to avoid harassment of marine mammals, including whales, seals, walruses or polar bears. SAE will coordinate the timing and location of operations with the Com-Centers in Deadhorse and Kaktovik to

minimize impact to the subsistence activities or the Nuiqsut/Kaktovik bowhead whale hunt.

Stage 3: If a conflict between project activities and subsistence hunting does occur, SAE states that it will immediately contact the project manager and the Com-Center. If avoidance is not possible, the project manager will initiate communication with a representative from the impacted subsistence hunter group(s) to resolve the issue and to plan an alternative course of action.

In addition, SAE and its contractors will work with local villages and Kuukpik Cooperation to identify qualified individuals that are interested in working on its program and provide employment opportunities.

Finally, SAE has signed a Conflict Avoidance Agreement (CAA) with the Alaska whaling communities to further ensure that its open-water seismic survey activities in the Beaufort Sea will not have unmitigable impacts to subsistence activities. NMFS has included appropriate measures identified in the CAA in the IHA.

Mitigation Measures for Subsistence Activities

The following mitigation measures will be imposed in order to effect the least practicable adverse impact on the availability of marine mammal species for subsistence uses:

(i) Establishment and operations of Communication and Call Centers (Com-Center) Program

- For the purposes of reducing or eliminating conflicts between subsistence whaling activities and SAE's survey program, SAE will participate with other operators in the Com-Center Program. Com-Centers will be operated to facilitate

communication of information between SAE and subsistence whalers. The Com-Centers will be operated 24 hours/day during the 2014 fall subsistence bowhead whale hunt.

- All vessels shall report to the appropriate Com-Center at least once every six hours, commencing each day with a call at approximately 06:00 hours.
- The appropriate Com-Center shall be notified if there is any significant change in plans, such as an unannounced start-up of operations or significant deviations from announced course, and that Com-Center shall notify all whalers of such changes. The appropriate Com-Center also shall be called regarding any unsafe or unanticipated ice conditions.

(ii) SAE shall monitor the positions of all of its vessels and exercise due care in avoiding any areas where subsistence activity is active.

(iii) Routing barge and transit vessels:

- Vessels transiting in the Beaufort Sea east of Bullen Point to the Canadian border shall remain at least 5 miles offshore during transit along the coast, provided ice and sea conditions allow. During transit in the Chukchi Sea, vessels shall remain as far offshore as weather and ice conditions allow, and at all times at least 5 miles offshore.
- From August 31 to October 31, vessels in the Chukchi Sea or Beaufort Sea shall remain at least 20 miles offshore of the coast of Alaska from Icy Cape in the Chukchi Sea to Pitt Point on the east side of Smith Bay in the Beaufort Sea, unless ice conditions or an emergency that threatens the safety of the vessel or

crew prevents compliance with this requirement. This condition shall not apply to vessels actively engaged in transit to or from a coastal community to conduct crew changes or logistical support operations.

- Vessels shall be operated at speeds necessary to ensure no physical contact with whales occurs, and to make any other potential conflicts with bowheads or whalers unlikely. Vessel speeds shall be less than 10 knots in the proximity of feeding whales or whale aggregations.
- If any vessel inadvertently approaches within 1.6 kilometers (1 mile) of observed bowhead whales, except when providing emergency assistance to whalers or in other emergency situations, the vessel operator will take reasonable precautions to avoid potential interaction with the bowhead whales by taking one or more of the following actions, as appropriate:
  - Reducing vessel speed to less than 5 knots within 900 feet of the whale(s);
  - Steering around the whale(s) if possible;
  - Operating the vessel(s) in such a way as to avoid separating members of a group of whales from other members of the group;
  - Operating the vessel(s) to avoid causing a whale to make multiple changes in direction; and
  - Checking the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged.

(iv) Limitation on seismic surveys in the Beaufort Sea

- Kaktovik: No seismic survey from the Canadian Border to the Canning River

from August 25 to close of the fall bowhead whale hunt in Kaktovik and Nuiqsut. From August 10 to August 25, SAE will communicate and collaborate with the Alaska Eskimo Whaling Commission (AEWC) on any planned vessel movement in and around Kaktovik and Cross Island to avoid impacts to whale hunting.

- Nuiqsut:
  - Pt. Storkerson to Thetis Island: No seismic survey prior to July 25 inside the Barrier Islands. No seismic survey from August 25 to close of fall bowhead whale hunting outside the Barrier Island in Nuiqsut.
  - Canning River to Pt. Storkerson: No seismic survey from August 25 to the close of bowhead whale subsistence hunting in Nuiqsut.
- Barrow: No seismic survey from Pitt Point on the east side of Smith Bay to a location about half way between Barrow and Peard Bay from September 15 to the close of the fall bowhead whale hunt in Barrow.

(v) SAE shall complete operations in time to allow such vessels to complete transit through the Bering Strait to a point south of 59 degrees North latitude no later than November 15, 2014. Any vessel that encounters weather or ice that will prevent compliance with this date shall coordinate its transit through the Bering Strait to a point south of 59 degrees North latitude with the appropriate Com-Centers. SAE vessels shall, weather and ice permitting, transit east of St. Lawrence Island and no closer than 10 miles from the shore of St. Lawrence Island.

In addition, SAE is conducting the planned seismic surveys in a joint partnership agreement with the Kuukpik Corporation. As a joint venture partner with Kuukpik, SAE

states that it will be working closely with Kuukpik and the communities on the North Slope to plan operations that will include measures that are environmentally suitable and that do not impact local subsistence use.

Unmitigable Adverse Impact Analysis and Determination

SAE has adopted a spatial and temporal strategy for its 3D OBN seismic survey that should minimize impacts to subsistence hunters and ensure the sufficient availability of species for hunters to meet subsistence needs. SAE will temporarily cease seismic activities during the fall bowhead whale hunt, which will allow the hunt to occur without any adverse impact from SAE's activities. Although some seal hunting co-occurs temporally with SAE's seismic survey, the locations do not overlap, so SAE's activities will not impact the hunting areas and will not directly displace sealers or place physical barriers between the sealers and the seals. In addition, SAE is conducting the seismic surveys in a joint partnership agreement with Kuukpik Corporation, which allows SAE to work closely with the native communities on the North Slope to plan operations that include measures that are environmentally suitable and that do not impact local subsistence use, and to adjust the operations, if necessary, to minimize any potential impacts that might arise. Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from SAE's activities.

Endangered Species Act (ESA)

Bowhead whales, ringed seals, and bearded seals are the only marine mammal species currently listed as endangered or threatened under the ESA that could be impacted by SAE's

3D OBN seismic surveys during the 2014 Arctic open-water season. NMFS' Permits and Conservation Division consulted with NMFS' Alaska Regional Office Division of Protected Resources under section 7 of the ESA on the issuance of an IHA to SAE under section 101(a)(5)(D) of the MMPA for this activity. A Biological Opinion was issued on August 8, 2014, which concluded that issuance of the IHA is not likely to jeopardize the continued existence of the ESA-listed marine mammal species. An Incidental Take Statement was issued under this Biological Opinion that contains reasonable and prudent measures, with implementing terms and conditions, to minimize the effects of takes of listed species.

National Environmental Policy Act (NEPA)

In 2013, NMFS prepared an EA that included an analysis of potential environmental effects associated with NMFS' issuance of an IHA to SAE to take marine mammals incidental to conducting a proposed 3D OBN seismic survey in the Beaufort Sea during the 2013 open-water season. However, due to logistical issues, SAE was not able to conduct the survey in 2013 and postponed the survey to the open-water season of 2014. After analyzing and comparing SAE's 2014 3D seismic survey and the survey proposed for 2013, as well as the affected environment in the 2014 and proposed 2013 action areas, NMFS concluded that SAE's 2014 action is essentially the same as the one SAE proposed in 2013, and that there are no material changes in the affected environment between 2013 and 2014. Therefore, NMFS determined that the information and analyses in its 2013 EA is still up-to-date and applicable for addressing the NEPA analysis related to the issuance of an IHA to SAE for the take of marine mammals during SAE's 2014 Arctic open-water survey. Based on the EA, NMFS prepared a FONSI for this action. Therefore, preparation of an EIS is not necessary.

Authorization

As a result of these determinations, NMFS has issued an IHA to SAE to take marine mammals incidental to SAE's 2014 3D OBN seismic survey in the Beaufort Sea, Alaska, and the IHA incorporates the mitigation, monitoring, and reporting requirements described in this Federal Register notice.

Dated: August 25, 2014.

_____

Donna S. Wieting, Director,
Office of Protected Resources,
National Marine Fisheries Service.

[FR Doc. 2014-20726 Filed 08/29/2014 at 8:45 am; Publication Date: 09/02/2014]